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1. Document ID: US 5677699 A

L1: Entry 1 of 4 File: USPT Oct 14, 1997

US-PAT-NO: 5677699
DOCUMENT-IDENTIFIER: US 5677699 A

TITLE: Helical microstrip antenna with impedance taper

DATE-ISSUED: October 14, 1997

INT-CL: [6] H01Q 1/36, H01Q 11/08
US-CL-ISSUED: 343/895; 343/846
US-CL-CURRENT: 343/895; 343/846
FIELD-OF-SEARCH: 343/895, 343/846

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Draw Desc | Image

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2. Document ID: US 5633649 A

L1: Entry 2 of 4 File: USPT May 27, 1997

US-PAT-NO: 5633649
DOCUMENT-IDENTIFIER: US 5633649 A

TITLE: Radar system and components therefore for transmitting an electromagnetic signal underwater

DATE-ISSUED: May 27, 1997

INT-CL: [6] H01Q 11/08, H01Q 1/00
US-CL-ISSUED: 343/895; 343/788, 343/876, 343/705
US-CL-CURRENT: 343/895; 343/705, 343/788, 343/876
FIELD-OF-SEARCH: 343/895, 343/787, 343/788, 343/876, 343/705, 343/707, 343/709

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Draw Desc | Image

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3. Document ID: US 5315561 A

L1: Entry 3 of 4 File: USPT May 24, 1994

US-PAT-NO: 5315561
DOCUMENT-IDENTIFIER: US 5315561 A

TITLE: Radar system and components therefore for transmitting an electromagnetic signal underwater

DATE-ISSUED: May 24, 1994

INT-CL: [5] G01S 13/04
US-CL-ISSUED: 367/1; 342/22
US-CL-CURRENT: 367/1; 342/22
FIELD-OF-SEARCH: 367/1, 367/131, 342/22

Full | Title | Citation | Front | Review | Classification | Date | Reference | KWIC | Draw Desc | Image

4. Document ID: US 4495503 A

L1: Entry 4 of 4 File: USPT Jan 22, 1985

US-PAT-NO: 4495503
DOCUMENT-IDENTIFIER: US 4495503 A

TITLE: Slow wave antenna

DATE-ISSUED: January 22, 1985

INT-CL: [3] H01Q 1/36, H01Q 13/18
US-CL-ISSUED: 343/746; 343/748, 343/768, 343/895
US-CL-CURRENT: 343/746; 343/748, 343/768, 343/895
FIELD-OF-SEARCH: 343/895, 343/788, 343/767-769, 343/770, 343/731, 343/732, 343/741, 343/742, 343/745, 343/746, 343/748-750, 343/789, 343/829, 343/830, 343/841-843

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☐ 1. Document ID: US 5677699 A

L1: Entry 1 of 4 File: USPT Oct 14, 1997

DOCUMENT-IDENTIFIER: US 5677699 A
TITLE: Helical microstrip antenna with impedance taper

DEPR:
Indeed, the distance of the internal conductor can be dynamically controlled, e.g. by a mechanical system controlled by a switchable relays or motors. For example if the internal conductor is flexible, hinged or otherwise moveable, an arm controlled from a motor or relay can move the internal conductor nearer or farther from the helical conductor, allowing dynamic control and changing of the radiation loss and thus the shape of the radiation lobe from the antenna, from a remote location. As another example, the internal helical conductor can be a flexible conductive sheet having one edge fixed and the other edge wound on a central axle, can be wound and unwound from the central axle, changing the distance of the entire internal conductor from the helical conductor, thus varying the length to gain ratio of the antenna or different parts thereof.

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image |

☐ 2. Document ID: US 5633649 A

L1: Entry 2 of 4 File: USPT May 27, 1997

DOCUMENT-IDENTIFIER: US 5633649 A
TITLE: Radar system and components therefore for transmitting an electromagnetic signal underwater

ABPL:
An antenna for transmitting electromagnetic signals having a frequency less than 500 Hz includes a beam of dielectric material and a conductive sheet wound in a helical pattern around the beam of dielectric material. The antenna further includes a core fabricated from a silicon and iron alloy, the cote disposed between the beam of dielectric material and the conductive sheet. With such an arrangement, a magnetic dipole antenna is provided capable of providing a magnetic moment of approximately 10.sup.6 to 10.sup.7 Am.sup.2.

BSPR:
In accordance with a further aspect of the present invention, an antenna for transmitting electromagnetic signals having a frequency less than 500 Hz includes a beam of dielectric material and a conductive sheet wound in a helical pattern around the beam of dielectric material. The antenna further includes a core fabricated from a silicon and iron alloy, the core disposed between the beam of dielectric material and the conductive sheet. With such an arrangement, a magnetic dipole antenna is provided capable of providing a magnetic moment of approximately 10.sup.6 to 10.sup.7 Am.sup.2.

DEPR:
Referring now to FIGS. 3 and 3A, the construction of the antenna 20 is shown. The antenna 20 provides a low impedance and a high magnetic moment. The low impedance is required to ensure a short time constant required for the radar system 10 (FIG. 1). The antenna 20 is a Horizontal Magnetic Dipole (HMD) antenna instead of an Horizontal Electric Dipole (HED) antenna. For the frequencies required, an electric dipole antenna in air would require an unrealistic length to achieve resonance, and thus carry a large current. As described above, a magnetic moment of approximately 10.sup.6 to 10.sup.7 Am.sup.2 is required for the contemplated radar system 10. The antenna 20 is a solenoidal antenna having a "sheet-like" winding provided by conductive sheet 50 wound in a helical pattern. The conductive sheet 50 is a copper foil having a thickness of ten millimeters and a width of approximately 330 millimeters: A dielectric beam 52 is disposed within the winding of the conductive sheet 50 to provide a support structure to maintain the mechanical integrity of the antenna 20. The dielectric beam 52 is comprised of a dielectric material, here wood, and has a square cross section. A laminated core 54 is disposed between the dielectric beam 52 and the winding of conductive sheet 50 to increase the magnetic moment of the antenna 20. The conductive sheet 50 is wrapped around the laminated core 54 at an angle .alpha., here 13 degrees. Such an angle provides 45 turns of the conductive sheet 50 around the laminated core 54 at a length of 15 meters.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image

3. Document ID: US 5315561 A

L1: Entry 3 of 4 File: USPT May 24, 1994

DOCUMENT-IDENTIFIER: US 5315561 A
TITLE: Radar system and components therefore for transmitting an electromagnetic signal underwater

BSPR:
In accordance with a further aspect of the present invention, an antenna for transmitting electromagnetic signals having a frequency less than 500 Hz includes a beam of dielectric material and a conductive sheet wound in a helical pattern around the beam of dielectric material. The antenna further includes a core fabricated from a silicon and iron alloy, the core disposed between the beam of dielectric material and the conductive sheet. With such an arrangement, a magnetic dipole antenna is provided capable of providing a magnetic moment of approximately 10.sup.6 to 10.sup.7 Am.sup.2.

DEPR:
Referring now to FIGS. 3 and 3A, the construction of the antenna 20 is shown. The antenna 20 provides a low impedance and a high magnetic moment. The low impedance is required to ensure a short time constant required for the radar system 10 (FIG. 1). The antenna 20 is a Horizontal Magnetic Dipole (HMD) antenna instead of an Horizontal Electric Dipole (HED) antenna. For the frequencies required, an electric dipole antenna in air would require an unrealistic length to achieve resonance, and thus carry a large current. As described above, a magnetic moment of approximately 10.sup.6 to 10.sup.7 Am.sup.2 is required for the contemplated radar system 10. The antenna 20 is a solenoidal antenna having a "sheet-like" winding provided by conductive sheet 50 wound in a helical pattern. The conductive sheet 50 is a copper foil having a thickness of ten millimeters and a width of approximately 330 millimeters. A dielectric beam 52 is disposed within the winding of the conductive sheet 50 to provide a support structure to maintain the mechanical integrity of the antenna 20. The dielectric beam 52 is comprised of a dielectric material, here wood, and has a square cross section. A laminated core 54 is disposed between the dielectric beam 52 and the winding of conductive sheet 50 to increase the magnetic moment of the antenna 20. The conductive sheet 50 is wrapped around the laminated core 54 at an angle .alpha., here 13 degrees. Such an angle provides 45 turns of the conductive sheet 50 around the laminated core 54 at a length of 15 meters.

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Draw Desc | Image

☐ 4. Document ID: US 4495503 A

L1: Entry 4 of 4   File: USPT   Jan 22, 1985

DOCUMENT-IDENTIFIER: US 4495503 A
TITLE: Slow wave antenna

ABPL:
Slow wave antenna including slow wave structure of a helical coiled conductor having linear capacitance and inductance distribution. Driving point impedance is changed by varying the ratio of the distributive capacitance to the distributed inductance. Tuning is changed by changing the capacitance between the distributive capacitance common and RF ground. Slow wave antenna structure includes a first embodiment having a slotted pipe with a helically wound conductor and a second embodiment includes a helically coiled element with a plane capacitance structure. In the slotted type of helically wound center conductor antenna, the antenna is tuned by changing the distance between the helix and the outside diameter of the pipe. The antenna is also tuned by changing the capacitance between the pipe and the ground of the RF system. In the helical element with a plane capacitance sheet antenna, tuning is accomplished by varying the spacing of the sheet and hence the capacitance between a conductive sheet and the helix.

BSPR:
According to another embodiment of the present invention, there is provided a slow wave antenna having a helical element with a plane capacitance structure disposed adjacent to the helically wound coil and supported and insulated therefrom whereby the helically wound coil is substantially parallel to the capacitive conductive sheet and tuning is provided by changing the spacing between the conductive sheet and the helically wound coil.

DEPR:
The Q of the antenna and the driving point impedance is varied by changing the ratio of the distributed capacitance to distributed inductance for the given predetermined geometry. The tuning of the antenna element, either 10 or 100, can be changed by changing the amount of distributed capacitance or capacitance from the distributed capacitance common to RF ground by variable capacitor 212. The tuning of the slow wave antenna 10 is accomplished by changing the position of the slotted cylindrical member 14 in FIG. 1 along the longitudinal length of the helical coil as indicated by arrow 68. The standing wave ratio is adjusted by sliding the cylindrical member 46 along the helical coil 26 where the washers 56 and 58 provide for the sliding engagement. The metallic cylindrical member 46 represents the distributed capacitance common 204 in FIG. 5. The tuning of slow wave antenna 100 is accomplished by moving the position of the conductive sheet 104 in distance with respect to the helical coil 106. The distributed capacitance represented by capacitors 202a-202n in FIG. 5 is varied by the position of the conductive sheet 104 with respect to the helical coil 106 by the spring biased bolts with winged nuts.

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